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MEMORABILIA BOTANICA, II.

(Edited by Erwin F. Smith, B.S., D.S., Washington, D.C.)

A JOURNEY INTO THE TROPICS.

IN recent years the botanical garden at Buitenzorg, Java, has become a sort of Mecca for European botanists. Solms-Laubach, Schimper, Goebel, and many others have there studied tropical vegetation. Probably no other botanical garden in the tropics offers as good facilities for study, and certainly no other is so well-equipped, has been used as extensively or has been productive of anything like as much good work.

One of the results of a sojourn at Buitenzorg is a new book of 300 pp. by Dr. Haberlandt ("Eine Botanische Tropenreise") giving travel sketches and graphic accounts of the Indo-Malaysian vegetation. The author has not confined himself to dry dissertations, but has had his eyes open to the biological side of botany, has known how wisely to omit, and has mixed in enough general observations and human interest to make a readable book and one of considerable general interest, even without the useful illustrations of characteristic vegetation, reproduced from pencil drawings. To describe all the interesting things in this book would be nearly equivalent to translating it. It must suffice, therefore, to call attention to some of the leading features. The book begins with the departure from Trieste; gives a chapter or two on the outward voyage, including some account of Bombay; describes the garden at Buitenzorg; discusses its climate and devotes a chapter to each of the following topics: The tree of the tropics, tropical foliage, flowers and fruits of the tropics, lianas, epiphytes, tropical ant-plants, the primeval forest, the mangroves, etc. The reader will also find fresh and interesting notes on a variety of cultivated plants,—tea, coffee, rice, cocoa-nut, cinnamon, cinchona, banana, etc. Various excursions into the island are described, and one chapter is devoted to the animals of Java and another to the inhabitants,—their language, customs, amusements, etc. On the return journey Dr. Haberlandt spent a few days in Ceylon and finally crossed the Arabian desert in Egypt, already classic ground by reason of the admirable researches of George Volken on the adaptations of the desert flora.

Not least attractive is the poetic and artistic feeling and the strong personal element that pervades the book. The following are some of the things that attracted special attention: The extent to which variegated leaved plants

have been substituted for flowers in tropical landscape gardening; the broken contour of the forest, certain species towering far above the rest and noticeable at a long distance; the general whiteness of the tree trunks; the preponderance of woody growths; the form of branching, in many cases quite unlike that of European trees; the very rapid pushing of leafy shoots which hang down, pale or reddish, weak and limp, until they have reached full size and then gradually become green, erect and self-supporting; the nearly uniform absence of periodicity in leaf fall; the marked tendency of the foliage to be entire, smooth and coriaceous, to which is often added a lacquer-like lustre; the dazzling reflected light of tropical foliage, in striking contrast with the mild transmitted light of European foliage; the numerous modifications of leaves and changes of position to avoid very intense light; the enormous assimilative power of individual leaves and the comparatively small number on a tree; the excessive brightness of the sky and the great amount of light in the interior of a tropical forest, the shade being not nearly so dense as in an European beech wood; the enormous vegetative activity, the sharp struggle for light, and the occupancy in the forest of every available foot of space, an almost impenetrable thicket on the ground, epiphytes and lianas on the trunks of trees in great profusion lifted up out of the surface tangle, and individual trees reaching the necessary light by expanding their tops above the rest of the forest; the general lack of protective adaptations against cold, so that one comes to understand the full meaning of many northern modifications only after he has studied the tropical vegetation; the very rapid growth (in young trees frequently as much as five metres a year), which takes place in an atmosphere so moist that transpiration is greatly diminished or at times stopped altogether, and which goes to show that there is no necessary connection between the transpiration stream and the upward movement of plant foods from the roots, osmotic action being sufficient to bring it about; the noticeable absence of palms from the forest; the curious adaptations to conserve moisture, roots within pitchers, etc.; the occurrence of breathing roots in the swamp plants, *Sonneratia* and *Avicennia*, and of bracing roots in many trees, in *Sterculia* enormously developed; the numerous extra functions of tropical roots, most striking of all "the change of the aerial roots of various Orchideae into green, ribbon-shaped organs of assimilation" (*Taniophyllum Zollingeri* has no other); the preponderance of bright colors in tropical flowers (white, yellow, orange, and bright red) and the rarity of blue flowers; and, finally, the many leaves, stems, etc., in which a particular form seems to be of no value to the plant but has been retained because not harmful, the hypothesis being put forward that many of these forms, not all, are mere "Luxus Anpassungen," due to the internal energy of the plant, and are not modifications brought about by external agencies, such as food and climatic changes, the author pointing out that the multiplicity of these variations is greatest in the places where, according to the Darwinian law, they should be least, viz., in the tropics, where the climate varies but little,—"*Zwecklose Blattgestalten und ebensolche Verzweigungsformen, phantastisch sinnlose Blütenmodelle und tausend anderer morphologische Eigenschaften, die nutzlos sind, bleiben erhalten weil ihre Ausmerzung kein unbedingtes Erforderniss für der Fortexistenz der betreffenden Pflanzen war.*"

This is a volume to go on the shelf with Schimper and Goebel, but not until it has been read and enjoyed from cover to cover.

PARASITIC ALGAE.

ONE of the most interesting botanical finds during the Madison meeting of the A. A. A. S. was made by Mr.